

G5Q

PCB Power Relay

A Miniature Power Relay with 1-pole 10A Switching Capacity

- Compact single pole relay.
- Excellent switching performance for a variety of loads.
- Small, yet provide 8-kV impulse withstand voltage (between coil and contacts).
- Low coil power consumption (SPST-NO: 200 mW, SPDT: 400 mW)
- Coil insulation system: Class F (UL1446).
- IEC/EN 60335-1 conformed. (-HA Model)



RoHS Compliant

Model Number Legend

G5Q-□□□-□□-□□

1 2 3 4 5 6

- | | |
|---|---|
| <p>1. Number of Poles 1 : 1-pole</p> <p>2. Contact Form None : SPDT (1c) A : SPST-NO (1a)</p> <p>3. Enclosure rating None : Flux protection 4 : Sealed</p> | <p>4. Classification None : Standard EU : High-capacity</p> <p>5. Market Code None : General purpose HA : Home Appliance according to IEC/EN60335-1</p> <p>6. Coil Holding Voltage None : Not supported PW : Supported</p> |
|---|---|

Application Examples

- Ideal for output applications of control equipments.

Ordering Information

| Terminal Shape | Market Code | Classification | Contact form | Enclosure rating | Model | Rated coil voltage | Minimum packing unit |
|----------------|-----------------|----------------|-----------------|------------------|--------------|--------------------------------|----------------------|
| PCB terminals | General purpose | Standard | SPST-NO(1a) | Flux protection | G5Q-1A | 5VDC 9VDC 12VDC 24VDC | 100 pcs/tray |
| | | | | Sealed | G5Q-1A4 | | |
| | | | SPDT(1c) | Flux protection | G5Q-1 | | |
| | | | | Sealed | G5Q-14 | | |
| | | High-capacity | SPST-NO(1a) | Flux protection | G5Q-1A-EU | 5VDC 12VDC 24VDC | |
| | | | | Sealed | G5Q-1A4-EU | | |
| | | SPDT(1c) | Flux protection | G5Q-1-EU | | | |
| | | | Sealed | G5Q-14-EU | | | |
| | Home Appliance | Standard | SPST-NO(1a) | Flux protection | G5Q-1A-HA | 12VDC 24VDC | |
| | | | | | G5Q-1A-EU-HA | | |
| | | | | | G5Q-1-HA | | |
| | | | | | G5Q-1-HA-PW | | |
| | | High-capacity | SPDT(1c) | Flux protection | G5Q-1-EU-HA | 12VDC 24VDC | |
| | | | | | G5Q-1-HA | | |
| | | | | | G5Q-1-HA-PW | | |
| | | | | | G5Q-1-EU-HA | | |

Note 1. When ordering, add the rated coil voltage to the model number.

Example: G5Q-1A DC5

Rated coil voltage

Note 2. Contact your OMRON sales representative for tube packing models (40 pcs/tube).

■ Ratings

● Coil

| Contact form | Rated voltage | Rated current (mA) | Coil resistance (Ω) | Must operate voltage (V) | Must release voltage (V) | Max. voltage (V) | Power consumption (mW) |
|--------------|---------------|--------------------|---------------------|--------------------------|--------------------------|-------------------|----------------------------|
| SPST-NO (1a) | 5 VDC | 40 | 125 | 75% max. | 5% min. | 190% (at 23°C) | Approx. 200 |
| | 9 VDC | 22.2 | 405 | | | | |
| | 12 VDC | 16.7 | 720 | | | | |
| | 24 VDC | 8.3 | 2880 | | | | |
| SPDT (1c) | 5 VDC | 80 | 63 | | 5% min. 5 to 25%* | | Approx. 400 Approx. 36* |
| | 9 VDC | 44.4 | 202 | | | | |
| | 12 VDC | 33.3 | 360 | | | | |
| | 24 VDC | 16.7 | 1440 | | | | |

Note 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.

Note 2. The operating characteristics are measured at a coil temperature of 23°C.

Note 3. The "Max. voltage" is the maximum voltage that can be applied to the relay coil.

* Power consumption with Holding Voltage is 36mW. Please confirm the detail in page 6 Coil Voltage Reduction (Holding Voltage).

● Contacts

| Item | Load | Resistive load | | | |
|------------------------|---|-----------------|---------------|----------------------|----------------------|
| | | SPST-NO (1a) | | SPDT (1c) | |
| | | Standard | High-capacity | Standard | High-capacity |
| Contact Type | Single | | | | |
| Contact material | Ag-Alloy (Cd free) | | | | |
| Rated load (resistive) | 10 A at 125 VAC | 10 A at 250 VAC | | 10 A at 125 VAC (NO) | 10 A at 250 VAC (NO) |
| | 3 A at 125 VAC | 3 A at 125 VAC | | 3 A at 125 VAC (NO) | 3 A at 125 VAC (NO) |
| | 5 A at 250 VAC | 5 A at 250 VAC | | 5 A at 250 VAC (NO) | 5 A at 250 VAC (NO) |
| | 3 A at 250 VAC | 3 A at 250 VAC | | 3 A at 250 VAC (NO) | 3 A at 250 VAC (NO) |
| | 5 A at 30 VDC | 5 A at 30 VDC | | 5 A at 30 VDC (NO) | 5 A at 30 VDC (NO) |
| | | | 5 A at 30 VDC | | 3 A at 125 VAC (NC) |
| | | | | 3 A at 250 VAC (NC) | 3 A at 250 VAC (NC) |
| | | | | 3 A at 30 VDC (NC) | 3 A at 30 VDC (NC) |
| Rated carry current | 10 A (NO)/3 A (NC) | | | | |
| Max. switching voltage | 277 VAC, 30 VDC | | | | |
| Max. switching current | AC: 10 A (NO)/3 A (NC) DC: 5 A (NO)/3 A (NC) | | | | |

■ Characteristics

| Item | Classification | Standard model |
|---|---------------------------------------|--|
| Contact resistance *1 | | 100 mΩ max. |
| Operate time | | 10 ms max. |
| Release time | | 5 ms max. |
| Insulation resistance *2 | | 1,000 MΩ min. |
| Dielectric strength | Between coil and contacts | 4,000 VAC, 50/60 Hz for 1 min |
| | Between contacts of the same polarity | 1,000 VAC, 50/60 Hz for 1 min |
| Impulse withstand voltage (between coil and contacts) | | 8 kV (1.2 x 50 μs) |
| Vibration resistance | Destruction | 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude) |
| | Malfunction | 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude) |
| Shock resistance | Destruction | 1,000 m/s ² |
| | Malfunction | 100 m/s ² |
| Durability | Mechanical | 10,000,000 operations (18,000 operations per hour) |
| | Electrical | <ul style="list-style-type: none"> • NO <ul style="list-style-type: none"> 25,000 operations: 10 A at 250 VAC resistive load (operation: ON for 1 sec, OFF for 3 sec) <High-capacity type> 50,000 operations: 10 A at 125 VAC resistive load (operation: ON for 1 sec, OFF for 3 sec) 200,000 operations: 3 A at 125 VAC resistive load (operation: ON for 1 sec, OFF for 1 sec) 50,000 operations: 5 A at 250 VAC resistive load (operation: ON for 1 sec, OFF for 1 sec) 100,000 operations: 3 A at 250 VAC resistive load (operation: ON for 1 sec, OFF for 1 sec) 100,000 operations: 5 A at 30 VDC resistive load (operation: ON for 1 sec, OFF for 1 sec) • NC <ul style="list-style-type: none"> 200,000 operations: 3 A at 125 VAC resistive load (operation: ON for 1 sec, OFF for 1 sec) 100,000 operations: 3 A at 250 VAC resistive load (operation: ON for 1 sec, OFF for 1 sec) 100,000 operations: 3 A at 30 VDC resistive load (operation: ON for 1 sec, OFF for 1 sec) |
| Failure rate (P level) (reference *3) | | 10 mA at 5 VDC |
| Ambient operating temperature | | -40°C to 105°C (with no icing or condensation) -40°C to 85°C (with no icing or condensation) <High-capacity type> |
| Ambient operating humidity | | 5% to 85% |
| Weight | | Approx. 6.5 g |

Note. Note. Values in the above table are the initial values at 23°C.

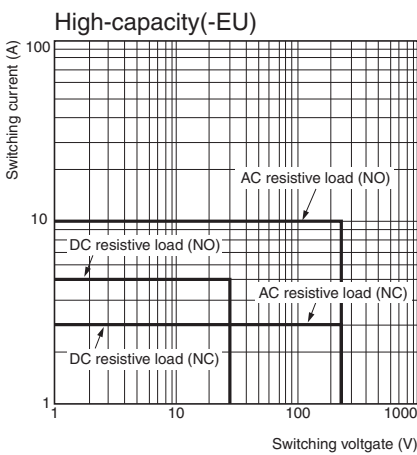
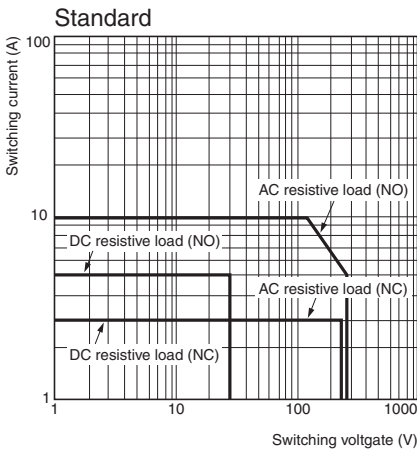
*1. The contact resistance is possible with 1 A applied at 5 VDC using a fall-of-potential method.

*2. Testing conditions: The insulation resistance was measured with a 500 VDC megohmmeter at the same locations as the dielectric strength was measured.

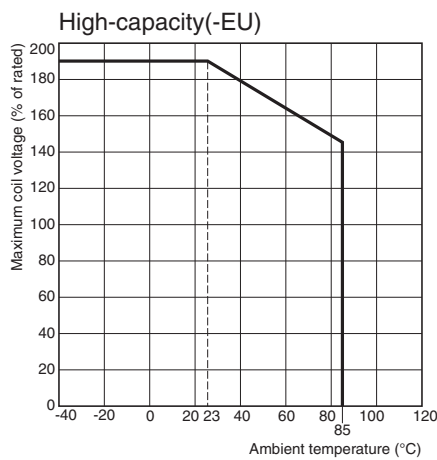
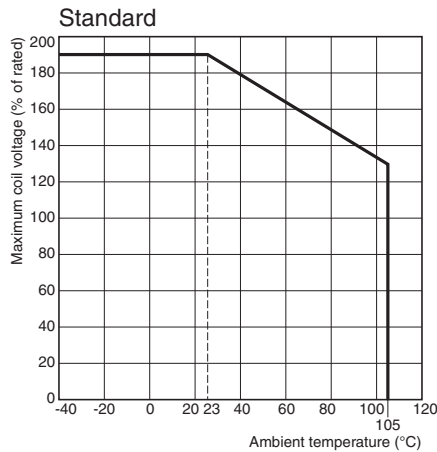
*3. This value was measured at a switching frequency of 120 operations/min.

Engineering Data

Maximum Switching Capacity

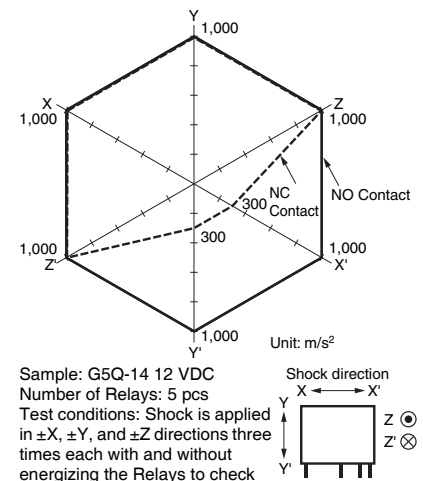


Ambient Temperature VS. Maximum Coil Voltage



Note. The Maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

Shock Malfunction

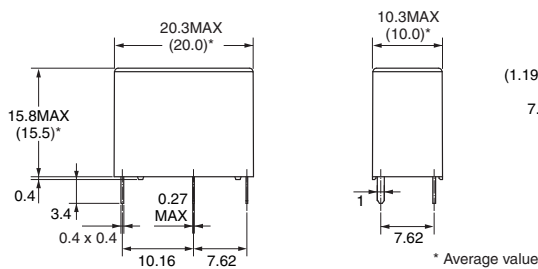
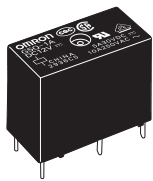


Sample: G5Q-14 12 VDC
 Number of Relays: 5 pcs
 Test conditions: Shock is applied in $\pm X$, $\pm Y$, and $\pm Z$ directions three times each with and without energizing the Relays to check the number of malfunctions.
 The energized voltage is 100% of the rated voltage.
 Requirement: None malfunction
 100 m/s²

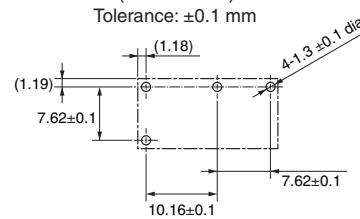
Dimensions

(Unit: mm)

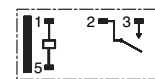
G5Q-1A(4)(-EU)(-HA)



PCB Mounting Holes (Bottom View)

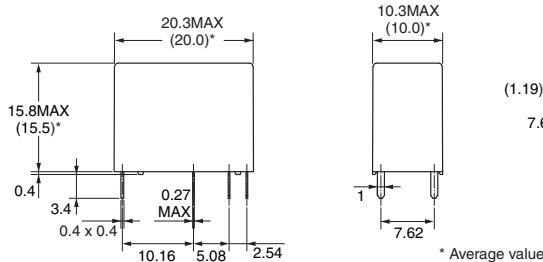
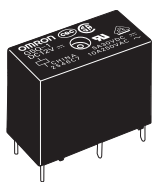


Terminal Arrangement/ Internal Connections (Bottom View)

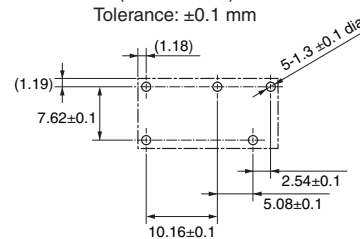


(No coil polarity)

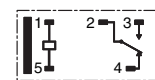
G5Q-1(4)(-EU)(-HA)(-PW)



PCB Mounting Holes (Bottom View)



Terminal Arrangement/ Internal Connections (Bottom View)



(No coil polarity)

Approved Standards

UL Recognized:  (File No. E41515)

CSA Certified:  (File No. LR31928)

| Model | Contact form | Coil ratings | Contact ratings | Number of test operations |
|--|---------------------------|--------------|---|---------------------------|
| G5Q-1A(4)(-EU)(-HA) G5Q-1(4)(-EU)(-HA)(-PW) | SPST-NO (1a) SPDT (1c) | 5 to 48 VDC | 10 A 250 VAC N.O. only (Resistive) 40°C | 6,000 |
| | | | 10 A 30 VDC N.O. only (Resistive) 40°C | |
| | | | 4 A 120 VAC N.O. only (Resistive) 40°C | 100,000 |
| | | | 3 A 250 VAC N.C. only (Resistive) 40°C | 6,000 |
| | | | 3 A 30 VDC N.C. only (Resistive) 40°C | |

EN/IEC, VDE  (Certified/No.40009467)

| Model | Contact form | Coil ratings | Contact ratings | Number of test operations |
|---------------------------------------|---------------------------|--------------|---|---------------------------|
| G5Q-1(4)(-HA)(-PW) G5Q-1A(4)(-HA) | SPST-NO (1a) SPDT (1c) | 5 to 48 VDC | 10 A making and 0 A breaking, 250 VAC (cosφ=1) 105°C 5 A marking and 3 A breaking, 30 VDC (0 ms) 105°C | 10,000 |
| | | | 5 A 250 VAC (cosφ=1) (N.O.) 105°C | 75,000 |
| G5Q-1A(4)-EU(-HA) G5Q-1(4)-EU(-HA) | | | 10 A 250 VAC (cosφ=1) (N.O.) 65°C 5 A 30 VDC (0 ms) (N.O.) 65°C 3 A 30 VDC (0 ms) (N.C.) 65°C | 10,000 |
| | | | 4 A 250 VAC (cosφ=1) (N.O.) 85°C | 100,000 |

| | |
|---|--|
| Creepage distance | 6.4 mm min. |
| Clearance distance | 5.5 mm min. |
| Insulation material group | IIIa |
| Type of insulation coil-contact circuit open contact circuit | Basic (Rated voltage 400 V) / Reinforced (Rated voltage 250 V) Micro disconnection |
| Rated Insulation voltage | 250 V |
| Pollution degree | 2 |
| Rated voltage system | 250 V / 400 V (EU flux type only) |
| Over voltage category | III |
| Category of protection according to IEC 61810-1 | RT II (Flux protection) / RT III (Sealed) |
| Glow wire according to IEC 60335-1 | <HA Models only> GWT 750°C min. (IEC 60695-2-11) / GWFI 850°C min. (IEC 60695-2-12) |
| Tracking Index of relay base | PTI 250 V min. (housing parts) |
| Flammability class according to UL94 | V-0 |
| Coil Insulation system | F Class (UL 1446) |

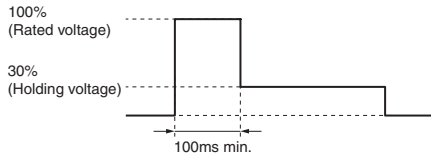
■Precautions

●Please refer to “PCB Relays Common Precautions” for correct use.

Correct Use

●Coil Voltage Reduction (Holding Voltage) after Relay operation

- If the coil voltage is reduced to the holding voltage after Relay operation, first apply the rated voltage to the coil for at least 100 ms, as shown below.
- A voltage of at least 30% of the rated voltage is required for the coil holding voltage. Do not allow voltage fluctuations to cause the coil holding voltage to fall below this level.



| | Applied coil voltage | Coil resistance* | Power consumption |
|-----------------|----------------------|---------------------------------|-------------------|
| Rated voltage | 100% | 63Ω (5 VDC) | Approx. 400 mW |
| Holding voltage | 30% | 360Ω (12 VDC) 1440Ω (24 VDC) | |

* The coil resistance were measured at a coil temperature of 23°C with tolerances of ±10%.

Please check each region's Terms & Conditions by region website.

OMRON Corporation

Electronic and Mechanical Components Company

Regional Contact

Americas

<https://www.components.omron.com/>

Asia-Pacific

<https://ecb.omron.com.sg/>

Korea

<https://www.omron-ecb.co.kr/>

Europe

<http://components.omron.eu/>

China

<https://www.ecb.omron.com.cn/>

Japan

<https://www.omron.co.jp/ecb/>